DOCUMENT RESUME

ED 235 922 PS 013 942

AUTHOR Nethercut, Gail; Adler, Nancy
TITLE Anxiety, Stress and Social Support: Prenatal Predictors of Obstetrical Outcomes.
PUB DATE Aug 83
NOTE 22p.; Paper presented at the Annual Meeting of the American Psychological Association (91st, Anaheim, CA, August 26-30, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Anxiety; Birth; *High Risk Persons; Mothers; Predictive Measurement; *Predictor Variables; *Pregnancy; Prenatal Influences; Questionnaires; *Social Support Groups; *Stress Variables
IDENTIFIERS *Obstetrical Complications

ABSTRACT

The role of anxiety, stress, and social support in predicting negative obstetrical outcomes was examined in a high-risk group of pregnant women. The predictor variables were assessed with separate self-report scales, including The Sarason Life Experience Survey, the Spielberger State/Trait Inventory, and a modified version of the Lazarus and Cohen Social Support Questionnaire. A total of 52 women between their twenty-second and twenty-eighth week of gestation, who were referred to a specialized clinic on the basis of certain medical risks, participated in the study. Data were analyzed in a prospective multiple regression design to investigate whether patients scoring high on anxiety and stress and low on social support were more inclined to experience obstetrical complications. Significant relationships were found between the psychosocial variables and obstetrical outcome. To investigate the possibility that findings were spuriously produced by the diagnosis and referral of patients to the high-risk clinic, psychosocial data collected at the same university clinic on low-risk pregnant women were compared with the data from the high-risk sample. The idea that a high-risk diagnosis leads to higher levels of psychosocial stress or anxiety was not substantiated. The predictive ability of psychosocial variables suggested that these constructs could be included in prenatal screening for better prediction of high-risk pregnancy. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED235922

Anxiety, stress and social support: Prenatal predictors of Obstetrical Outcomes

Gail Nethercut, M.A. & Nancy Adler, Ph.D.
Graduate Group in Psychology
University of California, San Francisco
San Francisco, CA. 94143

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gail E. Nethercut

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Presented at the American Psychological Association Meetings, Anaheim, California 1983.

PS 013942

Preliminary Results

Not to be quoted or cited without written permission.

ANXIETY, STRESS AND SOCIAL SUPPORT:
PRENATAL PREDICTORS OF OBSTETRICAL OUTCOME

The role of anxiety, stress and social support in predicting negative obstetrical outcome was examined in a high risk group of pregnant women. 52 women between their 22nd and 28th week of gestation, who were referred to a specialized clinic on the basis of certain medical risks, were participants in this study. Questionnaire data were analyzed in a prospective multiple regression design to investigate whether patients scoring high on anxiety and stress and low on social support were more inclined to experience obstetrical complications. Significant relationships were found between the psychosocial variables and obstetrical outcome. The predictive ability of psychosocial variables suggests that these constructs could be included in prenatal screening for better prediction of high risk pregnancy.

INTRODUCTION

Although estimates vary from one study to the next, it has been determined that premature delivery occurs in 5 to 10% of all births (Creasy & Liggins, 1979). Part of the variability in prematurity estimates may be caused by definitional differences in the two classification schemes used to describe these neonates. Under one set of criteria, infants weighing less than 2500 grams, regardless of their gestational age, have been labeled premature, small for date, or low birth weight neonates. A second scheme distinguishes infants born prior to 37 weeks of gestation from full term deliveries. Infants delivered before term are referred to as "preterm", and are particularly prone to low birth weight, respiratory disease such as hyaline membrane disease, systemic infection, intracranial hemorrhage, CNS damage, and difficulty in thermoregulation (Korones, Lancaster, & Roberts, 1972; Selby, Calhoun, Vogel, & Key, 1980).

Attempts have been made to predict women at risk for preterm labor(PTL) so that special efforts can be made in susceptible pregnancies to increase the probability that they will be maintained through gestational term. Previous studies have yielded a list of risk factors which act in concert to predict the occurrence of preterm labor. These risks include socioeconomic class; history of past pregnancy problems including previous preterm births or abortions; daily personal habits of a heavy work load, long commute or smoking; and current pregnancy indicators of toxemia, febrile illness and placenta previa (Creasy, Gummer, & Liggins, 1980; Fedrick, 1976; Giffei & Saling, 1974; Papiernik & Kaminski, 1974).

Originally, Papiernik (1969) developed a risk factor matrix that could identify 75% of preterm deliveries. This was accomplished, however, by placing 35% of the entire population in a high risk category. A second matrix developed more recently by Creasy et al.(1980), deems 10% of the population as possible preterm candidates, but predicts only 65% of actual preterm outcomes. Since the incidence of preterm delivery is about 7%, it is apparent that the sensitivity of the screening tool could still be improved. One inroad to refining this prediction may be found in examining certain psychological variables such as stress and anxiety in high risk populations.

Prenatal anxiety has been assessed in many studies that have investigated its role as a predisposing factor in later obstetrical complications (Beck, Siegel, Davidson, Kormeier, Breitenstein, & Hall, 1980; Crandon, 1979; Davids, DeVault, & Talmadge, 1961; Davids & DeVault, 1962; Gorsuch & Key, 1974; Klusman, 1975; Jones, 1978; Lederman, Lederman, Work, & McCann, 1980; McDonald & Parham, 1964; McDonald & Christakos, 1963; Norbeck & Tilden, 1983). In fact, it has been concluded in the one extensive literature review of this field, that of all the psychological factors studied thus far, maternal anxiety has been most consistently associated with obstetrical complications(McDonald, 1968). In more recent support of this proposition, Gorsuch and Key (1974) found higher levels of state anxiety (as measured by the Spieberger State/Trait inventory: Spielberger, Gorsuch, & Lushene, 1970) to be significantly associated with negative pregnancy outcomes. This relationship, however, only held for anxiety measures recorded in the first trimester. Other reports have found state anxiety measured in the late stages of pregnancy to be positively correlated with length in labor and fetal heart rate (Lederman et al., 1980; Klusman, 1975).

The statistical analyses in many of these studies, however, have used correlations or repeated t-tests. When anxiety has been examined in more rigorous multivariate designs, the findings have been more equivocal. Beck et al.(1980) for example, measured state anxiety in a sample of 102 pregnant women at three time points: twice in the third trimester pre and post a Lamaze class, and a third time at the onset of labor. Their results, similar to Lederman et al.(1980), revealed that state anxiety, measured at the entrance of the delivery room, acted as a significant predictor of labor length and subjective ratings of pain. Obstetrical complications, however, were not predicted in their multiple regression equation by either state or trait anxiety assessed at any one of the three time points.

In summary, there is evidence that supports high anxiety as a characteristic of women with complicated labor and deliveries. The strength of much of this evidence, however, is correlational or derived from studies that have classified women postnatally into a complicated or noncomplicated group and analyzed group differences with repeated t-tests. Results from these reports have demonstrated that elevated levels of anxiety are more prevalent among women with complicated deliveries(Crandon, 1979; Davids et al., 1961; Davids & DeVault, 1962; Gorsuch & Key, 1974; Klusman, 1975; Lederman et al., 1981; McDonald & Christakos, 1963; McDonald & Parham, 1964). When anxiety has been used as a predictor variable in multivariate designs, the findings have been less robust.

A second variable of interest in this study is life stress. Evidence of this psychological factor influencing obstetrical outcome is also mixed. For example, Norbeck and Tilden (1983) reported signifi-

cant associations of prenatal stress to overall obstetrical complications. Women with higher levels of stress experienced within the twelve months prior to their sixteenth gestational week were significantly more likely to have obstetrical complications. However, stress measured during the third trimester did not predict subsequent complications. Gorsuch and Key (1974) found high stress scores to charaterize subjects with complicated outcomes. It should be noted, however, that the stress measure was given to women following delivery, thereby reducing the validity of these findings.

Nuckolls, Cassel and Kaplan(1972), in a prospective study of 170 military wives, looked at the variables of psychosocial assets and life stress in regard to their impact on a number of obstetricai complications. Stress, as measured by the Holmes and Rahe self report scale, was determined for two time periods: the year prior to pregnancy, and the nine month period of pregnancy. Psychosocial assets represented a composite variable of social support resources, self esteem, quality of the marital relationship, and attitudes toward the pregnancy. Separate correlations of each independent measure with obstetrical complications did not uncover any significant associations. However, when the measures were dichotomized and cast in a contingency table, an interesting interaction emerged for a subset of 26 subjects. Women with high levels of pre-pregnancy and prenatal stress,and high scores on psychosocial assets had one third the complication rate of similarly stressed women who lacked psychosocial assets.

The role of social support as a mediating variable has been proposed by several investigators. Empirical support for this hypothesis can be found in the work of Schaefer, Coyne & Lazarus (1981) and Wil-

cox(1981). In both studies, the presence of social support was found to be associated with higher levels of mental health. Norbeck and Tilden (1983), however, did not find support for this hypothesis in obstetrical complications. Clearly more research needs to be done in this area before conclusions can be drawn.

It was the intent of this study to examine the role of anxiety and stress in predicting the occurrence of preterm labor in an "at-risk" sample. In addition, the availability and quality of a woman's social support was measured in order to ascertain the mediating effects, if any, of this variable on the onset of PTL. The aims of this study were twofold: 1) to explore these proposed relationships in a prospective design with a high risk group, and 2) to test the magnitude of effect for psychosocial variables so that an appropriate sample size for future analyses could be determined.

METHODS

Fifty two women of mixed parity were recruited through two high risk clinics offering specialized prenatal care for preterm labor candidates. Women were first seen in general obstetrical clinics and referred into the specialized clinics after chart review indicated a risk score of at least 10 points based on Creasy et al.(1980) risk matrix. All levels of socioeconomic status were represented in the sample. The ethnic distribution consisted of 56% Caucasion, 15% Latina, 13% black, 6% Oriental, and the remaining 10% from four other categories. Seventy-seven percent were partnered (i.e., had a financially and/or emotionally supportive relationship with the father of the baby), and 23% were single. Consent to take part in the study was obtained from 86% of those eligible in the preterm clinic population.

Recruitment for the psychological study was handled by clinic nurses. Nurses discussed the study's objectives with women on their second weekly visit to the clinic. This time delay was selected so that initial reactive effects of referral to the high risk clinic would be diminished at the time of psychological assessment. Consenting patients between their 22nd and 30th week of gestation were given a questionnaire packet and asked to complete the scales following the clinic appointment. Completion of these instruments required approximately 30 minutes.

The variables of stress, anxiety, and social support were assessed with separate self report scales:

The Sarason Life Experience Survey (Sarason, Johnson & Siegel, 1978), a 60 item scale was used to detemine the amount and impact of various stress events experienced by the patient within the past year.

Anxiety was assessed by the Spielberger State/Trait inventory (Spielberger, Gorsuch, & Lushene, 1970), a 40 item questionnaire which utilizes a Likert type response scale. This short inventory was chosen since it tapped both the transient flucuations characteristic of mood state, as well as the more enduring trait qualities of anxiety found over time.

A modified version of the Lazarus and Cohen (1979) Social Support Questionnaire was administered to measure the availability and quality of the woman's social support system. One section consisted of items that asked subjects who they relied on in a variety of situations (availability). In a second section, participants were asked to rate their relationships with spouse, friends, co-workers, closest relatives, and neighbors on a five point scale for 1) how much informa-

tion, suggestions, and guidance a particular relationship offered, 2) how reliable a person was, and 3) to what extent the person made the subject feel s/he cared about them (quality).

In addition to these self report measures, women were rated by the clinical staff on anxiety. This score, rated on a 1 to 5 point scale, was made at the end of each clinic visit and served as a concurrent indicator of the patient's emotional state.

Scoring of the questionnaires and outcome criteria was done by the researchers. Clinic staff were kept blind to any psychosocial data. Outcome data obtained from chart review were collected prior to the scoring of the psychological scales by the researcher.

RESULTS

The question of primary interest was whether anxiety and stress, measured prospectively, predicted preterm labor. The strategy underlying the data analysis was to use this pilot sample as a means to examine effect sizes and trends for the independent variables, as well as to test for possible significant relationships.

Means and standard deviations of the independent variables assessed in the sample are presented in Table 1.

A subset of the psychosocial variables was selected for the regression analyses. This strategy was used to maintain as much statistical power as possible. Two criteria were used for including predictor variables in the regression analyses; 1) strength of univariate relationship between each measure and the outcome, and 2) prior research showing a significant association with obstetrical outcome. The variables selected under the first criterion were quality of social sup-

port from the spouse and anxiety ratings made by the nurses. Variables choosen by the second criteria were availability of social support, quality of social support from others, state anxiety, total stress scores and negative stress scores.

A patient's risk factor score had been considered as a potential covariate in this analysis. However, a preliminary analysis indicated that risk factor scores accounted for less than 1% of the outcome variance. This variable, therefore, was not included in the regression analyses.

Three hierarchical regression analyses were conducted for the dependent measures of preterm labor.

1) In the first regression equation, the relationship of stress and anxiety to outcome was examined. The order of entry was a)self reported state anxiety and total stress, entered in the first step as a set, b)staff rated anxiety entered by itself, c) two-way interactions among the variables entered as the third step, and d) the three-way interaction of stress by state anxiety by staff rated anxiety entered in a final step.

2) In the second analysis, the independent measure of negative stress was evaluated instead of a patient's score of total stress. The order of entry in this equation was identical to the first regression.

3) In the third and final regression, an equation testing the role of social support as a mediator in stress impact was tested. The order of entry for this question was a)negative stress events that had occurred in the prior year, b) state anxiety and three social support scores representing quality and availability entered as a set, and c) the two way interactions between stress and social support indicators.

In the first analysis using total stress, state anxiety, and staff rated anxiety, neither the main effects or the two way interactions were significant(see Table 2). The increment testing the three way interaction was significant (F=5.096, df 1,44 P<.02), and accounted for 9.5% of the variance in preterm labor incidence. In order to interpret this interaction, the independent measures were dichotomized (based on median splits) and plotted (see Figure 1). As presented in the graph, subjects with high self and staff rated anxiety and high levels of stress were most inclined to experience preterm labor. In contrast, patients with high self reported anxiety, low staff rated anxiety, and low levels of stress were least inclined to labor early. When negative stress was used as the predictor variable in the second regression analysis, none of the increments were significant.

A power analysis was conducted on the regression run to determine whether the main effects or two way interactions would yield significant findings in a larger sample. The step that tested the two way interactions of negative stress, state anxiety and staff rated anxiety would have become significant at the .05 level with a sample of 200. Other steps in both regression analyses would have required samples larger than 200 for their effects to be significant.

The third analysis tested the effects of social support as a moderating variable. Although none of the interactions or main effects were significant, the variables indexing state anxiety and social support were found to account for 12.9% of the variance in preterm labor (F=1.718 df=4, 46 P<.16)(see Table 3).

DISCUSSION

The main question of this study concerned the predictive strength of anxiety and stress in preterm labor outcome. Empirical support for such a relationship was found in the significant interaction of staff rated anxiety, self reported anxiety, and stress. These findings lend some support to the hypothesis that prenatal psychosocial factors exert an effect on subsequent pregnancy outcomes.

The fact that the psychosocial data were collected prospectively adds some strength to an inference of causal contribution. However, it is possible that this finding was spuriously produced by the diagnosis and referral of patients to the high risk preterm clinic. In other words, instead of psychosocial variables(A) causing or influencing obstetrical outcome(B), a third variable such as high risk pregnancy(C) could have produced both A and B. To investigate this possibility, psychosocial data collected at the same university clinic on low risk pregnancy women(Norbeck and Tilden, 1983) were compared with scores from at-risk patients in the present study. The argument that diagnosis and experience of a high risk pregnancy affected the psychosocial variables would receive support if there were major diferences in scores for the two samples of women who were measured at about the same time in their pregnancies. No differences were found for negative stress events or trait anxiety between the groups. There was a ten point discrepancy, however, for levels of total stress. This difference was in the opposite direction than would be expected. The low risk women had a significantly higher mean score than preterm subjects($t=13.11$ $P<.001$). In addition, the mean state anxiety level was found to be 1.2 points higher in low risk women ($t=6.08$ $P<.001$). Al-

though this comparison cannot dismiss the alternative hypothesis listed above, it does dispute the assumption that a high risk diagnosis leads to higher levels of psychosocial stress or anxiety.

It was of particular interest in this study to examine the predictive ability of self reported anxiety as compared to staff ratings. As was seen in the zero order correlation matrix, these two assessments of patient anxiety were not at all correlated. The implication, therefore, is that the two measures represented different aspects of anxiety. A statistically significant relationship was found for staff rated anxiety when used in conjunction with self report psychosocial measures in preterm labor incidence. In addition to this three way interaction, staff ratings considered alone were found to account for a portion of variance in preterm labor that approached significance. Although the 5 point rating scale employed in this study has not been tested for its psychometric strength, it does suggest that including an independent observation of patient anxiety provides an important source of information in prediction.

The effect of stress on health status is believed to be mediated by a person's coping ability. Some have hypothesized that only negative stress experiences exert a demand on coping resources while others have argued that both positive and negative stress events require substantial adaptation(see Cohen 1979). The results of this study suggest that a score of total experiences may be more predictive than negative events considered alone.

The final analyses examined the role of social support and its potential buffering or mediating effects of stress on outcome. The analysis involving preterm labor did not lend support to Nuckolls' hy-

pothesis(Nuckolls et al., 1972) of an interactive effect. However, the findings did suggest that the quality of social support from a partner exerted a singular but critical influence on the likelihood of preterm labor. Although this effect was not significant in the present sample, a power analysis based on the effect size revealed that a significant relationship would emerge with a slightly larger sample(N=86).

Summary

In conclusion, this report found several interesting relationships between psychosocial variables and preterm labor. These findings are only preliminary and will have to be tested with a larger sample. The fact that psychosocial variables received statistical support in such a small sample is most encouraging. In addition, the positive trends found for several variables and their respective effect sizes suggest that the relationship of psychosocial variables to outcome in a high risk population may indeed be a very important one.

Figure11. Levels of Staff Rated Anxiety by State Anxiety & Stress for Preterm Labor

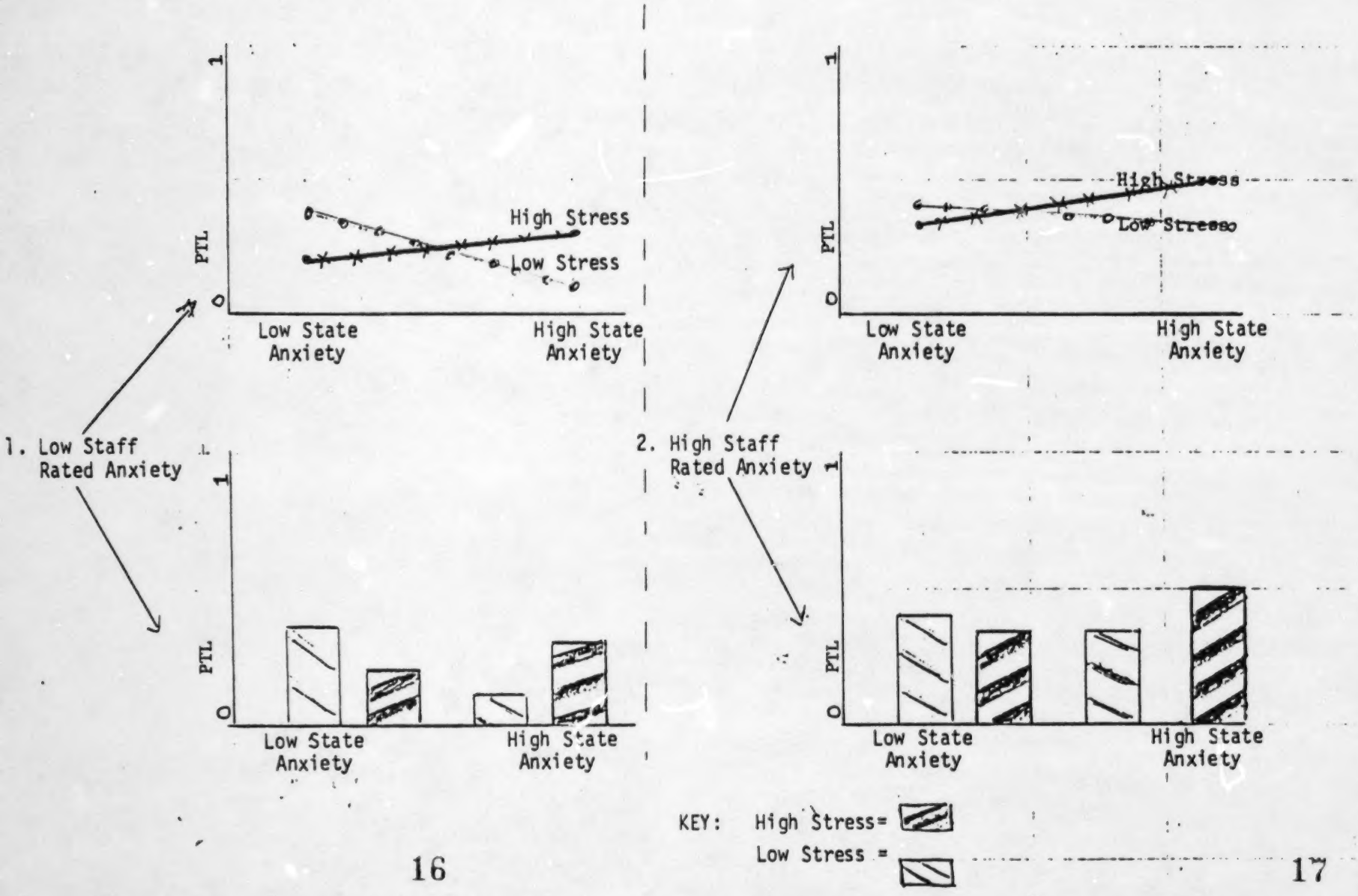

Table 1. Means and Standard Deviations for Predictor Variables

	Total Sample (n=52)		Women with Preterm Labor (n=16)	Women without Preterm Labor (n=36)
State Anxiety	36.85	mean	38.40	36.12
	9.98	s.d.	12.55	8.67
Negative Stress	8.60		7.81	8.97
	9.85		5.26	11.40
Total Stress	15.13		15.12	15.14
	11.13		8.33	12.31
Social Support Availability	10.03		10:00	10.05
	4.04		5.20	3.50
Social Support Spouse	10.76		8.81	11.65
	4.41		5.93	3.23
Social Support Other	65.34		63.68	66.08
	33.67		33.52	34.19
Staff Rated Anxiety	3.12		3.36	2.98
	.99		.80	1.07

Table 1

Relationship of State Anxiety, Total Stress, and Staff Rated Anxiety to Preterm Labor (N=52)

Source of Variation	df	RSQ increment	F	p
Psychological Self Reports State Anxiety Total Stress	2	.012	.30	NS
Staff Rated Anxiety	1	.030	1.53	NS (.19)
Interactions, Two-Way Anxiety X Stress Anxiety X Staff Rated Anxiety Stress X Staff Rated Anxiety	3	.046	.76	NS
Interaction, Three-Way Anxiety X Stress X Staff Rated Anxiety	1	.094	5.10	$<.02$
Entire Model	7	.183	1.41	NS
Error	44	.816		

Table 3

Relationship of Stress, Anxiety, and Social Support to Preterm Labor
(N=52)

Source of Variation	df	RSQ increment	F	p
Negative Stress	1	.003	.15	NS
Other Psychosocial Variables State Anxiety Social Support Availability Social Support Spouse Social Support Other	4	.129	1.71	NS (.16)
Interactions, Two-Way Stress X Anxiety Stress X Availability Stress X Spouse Support Stress X Other Support	4	.063	.833	NS
Entire Model	9	.196	1.14	NS
Error	42	.804		

REFERENCES

Beck, N.C., Siegel, L., Davidson, N., Kormeier, S., Breitenstein, A. & Hall, D. The prediction of pregnancy outcome: Maternal preparation, anxiety, and attitudinal sets. Journal of Psychosomatic Research, 1980, 24, 343-351.

Cohen, F. Personality, stress, and the development of physical illness. In G. Stone, F. Cohen, & N. Adler (Eds.) Health psychology: A handbook. San Francisco: Jossey Bass Publishers, 1979.

Crandon, A. Maternal anxiety and obstetric complications. Journal of Psychosomatic Research. 1974, 23, 109-111.

Creasy, R., Gummer, B., & Liggins, G. System for predicting spontaneous preterm birth. Obstetrics & Gynecology, 1980, 55, 692-695.

Creasy, R., Liggins, G. Aetiology and management of preterm birth labour. In J. Stallworthy & G. Bourne (Eds.) Recent Advances in obstetrics and gynaecology. New York: Chruchill Livingston, 1979.

Davids, A. & DeVault, S. Maternal anxiety during pregnancy and childbirth abnormalities. Psychosomatic Medicine, 1962, 24, 464-470.

Davids, A., DeVault, S., & Talmadge, M. Psychological study of emtional factors in pregnancy: A preliminary report. Psychosomatic Medicine, 1961, 23, 464-470.

Fedrick, J. Antenatal identification of women at high risk of spontaneous preterm birth. British Journal of Obstetrics, 1976, 83, 351-354.

Giffei, J. & Saling, E. First results and experiences with our prematurity and dysmaturity prevention program. Journal of Perinatal Medicine, 1974, 2, 45-53.

Gorsuch, R.L. & Key, M.K. Abnormalities of pregnancy as a fucntion of anxiety and life stress. Psychosomatic Medicine, 1974, 36, 352-362.

Jones, A.C. Life change and psychological distress as predictors of pregnancy outcome. Psychosomatic Medicine, 1978, 40, 402-412.

Klusman, L.W. Reduction of pain in childirth by the alleviation of anxiety during pregnancy. Journal of Counsulting and Clinical Psychology, 1975, 43, 162-165.

Korones, S.B., Lancaster, J. & Roberts, F. High risk newborn infants, St.Louis: Mosby, 1972.

Lazarus, R. & Cohen, F. The Social Support Questionnaire. University of California, Berkeley 1979.

Lederman, R.P., Lederman, E., Work, B.A., & McCann, D. The relationship of maternal anxiety, plasma catecholamines and plasma cortisol to progress in labor. American Journal of Obstetrics and Gynecology, 1978, 132, 495-500.

McDonald, R.L. The role of emotional factors in obstetric complications: A review. Psychosomatic Medicine, 1968, 86, 341-348.

McDonald, R.L. & Christakos, A.C. Relationship of emotional adjustment during pregnancy to obstetric complications. American Journal of Obstetrics and Gynecology, 1963, 86, 341-348.

McDonald, R.L. & Parham, K.J. Relations of emotional changes during pregnancy to obstetric complications in unmarried primigravidas. American Journal of Obstetrics and Gynecology. 1964, 90, 195-201.

Norbeck,J.S.& Tilden, V.P. Psychological and social factors in complications of pregnancy; A prospective, multivariate approach. Journal of Health and Social Behavior. 1983.

Nuckolls, K., Cassel, J. & Kaplan, B. Psychosocial assets, life crisis and the prognosis of pregnancy. American Journal of Epidemiology, 1972, 95, 431-441.

Papiernik, E. Le coefficent de risque d'accouchement premature. La Presse Medicale, 1969, 77, 793-794.

Papiernik, E. & Kaminski, M. Multifactorial study of the risk of prematurity at 32 weeks gestation. Journal of Perinatal Medicine, 1974, 2, 30-36.

Sarason, I.G., Johnson, J. & Siegel, J.M. Assessing the impact of life changes: Development of the life experiences survey. Journal of Consulting and Clinical Psychology. 1978, 46, 932-946.

Schaefer, C., Coyne, J.C. & Lazarus, R. The health related functions of social support. Journal of Behavioral Medicine. 1981, 4, 381-406.

Selby, J.W., Calhoun, L., Vogel, A. & King, H. Psychological reactions to preterm birth. In Psychology and human reproduction. New York: The Free Press, 1980.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R. Maunal for the STATE TRAIT Anxiety Inventory. Palo Alto, Ca.: Consulting Psychologists Press, 1970.

Wilcox, B.L. Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. American Journal of Commmunity Psychology. 1981, 9, 371-386.